

STUDY OF THE MARINE FAUNA OF THE KARWAR COAST AND THE NEIGHBOURING ISLANDS

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PART IV: ECHINODERMATA AND OTHER GROUPS

(Continued from p. 41 of this volume.)

This is the concluding part of the series of articles on the marine fauna of the Karwar coast and neighbouring islands. It deals mainly with the Echinoderms and minor groups, while some vertebrate fauna has merely been referred to.

ECHINODERMATA

This group is easily recognised by the presence of some degree of radial symmetry, usually pentaradiate. They move about by means of their tube-feet which are arranged along the radii. All the five classes of this phylum are well represented in Karwar. In December 1949, representatives of all the five classes of Echinoderms were collected in Kamat's Bay alone. The most common echinoderms found here are the starfishes, sea-cucumbers and sea-urchins. The larval forms have also been observed in the plankton.

ASTEROIDEA

Astropectinidae:

Astropecten is the only starfish that has been collected in good numbers. They are easily recognised by their five slender arms bordered by a row of large plates. These marginal plates are conspicuous and bear spines on their outside. The tube-feet have no suckers and they are pointed at their tips. There is no anus. They are usually found half buried in sand, exposed at low tide. They have been collected in large numbers in the southern region of Karwar Bay and also in Kamat's Bay from November to January. During the rest of the year they are only occasionally seen on the shores.

OPHIUROIDEA

Ophiothricidae:

A number of small brittle-stars have been collected from among the sponges and the ascidians encrusting the rocks in Kamat's Bay. They all belong to the genus *Ophiothrix*, recognised by their distinct central disc and long slender arms which are covered with fine serrated spines. They are greyish in colour and are seen struggling with their

long arms when the encrusting sponges and the ascidians are scraped off from the rocks. The number of arms in these brittle-stars varies from three to seven.

HOLOTHUROIDEA

Holothuriidae:

The sea-cucumbers are quite common in Karwar. They have been collected in Devagad Island and Kamat's Bay. *Holothuria atra* (Jager) is the only species collected in this area. They are elongated sausage-shaped animals without any arms. Their skin is very thick, leathery and is pigmented with purplish brown. At low tide, they can easily be observed half buried in sand in the crevices of rocks. They are very common at the northern end of Kincaid Bay and they have also been collected from Devagad Island. Those found in the latter area were very big, measuring about twelve inches in length.

ECHINOIDEA

Two families of sea-urchins, Temnopleuridae and Stomopneustidae are represented in Karwar. Only a few specimens of the former have been collected occasionally. Stomopneustidae are available in good numbers.

Temnopleuridae:

This family is represented by two genera in Karwar. *Temnopleura* is the commonest and has been collected in Kamat's Bay. It is a small form covered with slender spines which have faint brown bands. Live specimens have been collected in the crevices of rocks. Occasionally entire coronas are cast upon the shores and a few have been collected in Karwar Bay and Kamat's Bay. The corona is greyish in colour with very small tubercles arranged in two vertical rows in each area.

The other form is represented by only two specimens, probably belonging to the genus *Salmacis*. They have been found on the surface of the rocks in Kamat's Bay. They are fairly large in size covered with fine slender banded spines.

Stomopneustidae:

Bits of the corona and spines of *Stomopneustes* have always been collected washed ashore on almost all the beaches of Karwar. Occasionally a number of entire spines in heaps have been seen on the rocks which were slightly above the high tide level. Sometimes half-broken coronas have also been collected. These sea-urchins are recognised by the presence of big tubercles on their coronas and broad ambulacral areas. The spines are long, thick and of a deep violet colour. At the northern end of Kincaid Bay these sea-urchins are found in large numbers attached to rocks, which are always submerged in water. They have been collected from about one to two fathoms deep. It is said that they are available in large numbers in the Devagad islands also.

CRINOIDEA

Mariametridae:

A good number of feather-stars have been collected in the southern corner of Kamat's Bay only once in the month of December, 1949. They belong to the genus *Lamprometra*. The tide was low at the time of collection and they were found in a large depression of the rock covered over by water. It was a very interesting sight to see the continuous wriggling of the fine plumed arms of the animals and also the peculiar experience of the sticky feeling of their touch. They are flower-like in appearance with forty pinnate arms and a bunch of cirri at the base of the calyx. They were deep brown in colour with white blotches all over.

POLYZOA

This group is represented in Karwar by two families. They include plant-like colonial forms which are usually found in the shallow waters of the coast. Each colony consists of a number of individuals known as 'polyps' or 'zooids'. Each polyp is a cup-shaped structure with the mouth situated at the centre of the free end. The mouth is surrounded by a cirlet of ciliated tentacles springing from an expanded base known as the 'lophophore'. They possess a U-shaped alimentary canal with the mouth and the anus at the same end. The colonies are usually fixed to some solid substratum. Their ciliated free-swimming larval forms have often been observed in the plankton.

Membraniporidae:

In Kamat's Bay *Membranipora* is quite common, growing on seaweeds and the rocks. They form white encrusting colonies in which the zooids lie flat on stones, shells or algae. The colonies are membranous and calcareous or semi-calcareous and hence they are popularly known as 'sea-mats'. Bivalve shells with dry colonies of *Membranipora* encrusted on their inner surface, are also washed ashore.

The other form is plant-like, found attached to empty shells or sea-weeds cast upon the shore. Occasionally a few such colonies have been collected on the Karwar beach. These colonies are small, transparent and dichotomously branched. They may probably belong to the family *Bicellariidae*.

BRACHIOPODA

This group includes solitary animals enclosed by a bivalve shell which is secreted by the surface of the body. They are popularly known as 'lamp shells'. The only representative of this group recorded in Karwar is *Lingula*. It belongs to the family Lingulidae and order Ecardines. The two valves of the shell are thin, horny, somewhat rectangular in shape and of equal dimensions. There is a long fleshy stalk passing out between the two valves. The two valves are held together by a set of muscles; there is no hinge. They live in deep vertical burrows in muddy sands. However, only dry shells of *Lingula* have occasionally been collected on the Karwar beach.

CHAETOGNATHA

This is a small group including transparent pelagic animals. They are small, worm-like and often observed in the plankton darting about and appearing like cellophane arrows. They are popularly known as 'arrow-worms'. The body of these worms is divided into head, trunk and tail, bearing fan-like transparent projections. The mouth is on the ventral side of the head surrounded by curved bristles. *Sagitta* is the common arrow-worm abundantly seen in the plankton and easily recognised by its graceful swimming movements and the two pairs of lateral fins.

UROCHORDA

These animals are mostly sessile growing permanently attached to rocks or sea-weeds. A few are pelagic. They are easily recognised by the jets of water coming out of their body, when the animals are disturbed. They are commonly known as 'sea-squirts'. The forms collected and observed in Karwar are mostly colonial animals of the 'Compound Ascidian' type, and probably they belong to the family *Botryllidae*. Some solitary forms—'Simple Ascidians', have also been observed in the shell debris ('shell sand'), attached to bits of shells and dry pieces of weeds. The compound ascidians are commonly seen between tide marks as massive colonies encrusting the rocks which do not face the breaking waves and they are also found in the crevices of the rocks. These animals are abundant in Kamat's Bay, Binge Bay and Kincaid Bay. The rock surfaces near the low tide mark are usually covered with these ascidian colonies along with sea-weeds and sponges. These encrustations harbour a variety of animals such as planarians, nemertine worms, polychaete worms, sipunculid worms, isopods, amphipods, prawns, crabs, nudibranchs, ophiuroids, etc.

The free-swimming larva of ascidians, popularly known as the 'Tadpole larva of Tunicata', is often seen in the plankton in good numbers. It is usually seen swimming about by means of a short straight tail containing the dorsal nerve-cord and notochord.

The plankton also contains the free-swimming pelagic solitary tunicate, *Oikopleura*. They are found in large numbers almost throughout the year. They can easily be recognised by the jerky movements of their large locomotor tail which contains the notochord. Their body is comparatively small and is periodically cast off.

HIGHER CHORDATA

In these groups no attempt has been made to make intensive collections and also to classify them in detail. However, all those specimens which were easily available on the coasts have been collected. The chordates are numerous even if only the different kinds of fishes caught in the nets are included; and they would be too many if they were to be dealt with here in detail. Hence only the names of those that have been collected on the shores and those that are commonly seen in the area are recorded here.

Like other places on the west coast of India, Karwar also abounds in a large variety of fishes. The fishes are commonly divided into two sub-classes, the Elasmobranchii—cartilaginous fishes with at least five pairs of gill-slits—and the Teleostomi—bony fishes with the gills covered by an operculum. Amongst the cartilaginous fishes, the following sharks, skates and rays are frequently seen in the nets drawn to the shores: *Scoliodon*, *Chiloscyllium*, *Zygaena*, *Trygon*, *Aetobatis*, *Rhinobatus*, *Narcine*, etc. Amongst the bony fishes, the following are some of the most common: *Rastrelliger* (the common Indian Mackerel), *Tetrodon* (the Puffer fish), *Periophthalmus* (the mud-skipper), *Anguilla* (the eel), and many others like the *Triacanthus*, *Solea*, *Cynoglossus*, *Sillago*, *Silurus*, *Caranx*, *Serranus*, *Batrachus*, etc.

Sea-snakes have been collected occasionally on the Karwar shores. They were either caught in the fishermen's nets, or cast up on the beaches, or sometimes collected by hand nets. They varied in length from one to three feet. The smaller specimens were dark grey in colour with transverse yellow bands. These markings were faint in the larger specimens. The lower jaw has a median groove which is partly indented at the anterior end. These snakes probably belong to the genus *Enhydrina* (Gray). But it is interesting to note here that there are certain fundamental differences in the specimens collected in Karwar and the species already described, which has rendered the identification difficult. There are very small scales on the head and the ventrals are not at all distinct. The hemipenis is club-shaped and smooth.

Amongst the mammals, only Dolphins have been observed in the Karwar seas. When the water is calm they are often seen at the surface. They can easily be recognised by their peculiar swimming movements which is an up and down rolling motion in contrast to the side-to-side movements of the fish. They have very often been seen in the Baitkal Cove and Karwar Bay.

CONCLUSION

From the foregoing accounts (*J.B.N.H.S.*, 50 & 51), it is evident that the fauna of the Karwar coast and neighbouring islands offers a great variety covering almost all the classes of the animal kingdom. It should however be noted that the Karwar coast is conspicuous by the absence of any coral formations. In spite of the variety of forms recorded, their numbers are generally poor and their availability quite uncertain. This observation is especially true of such animals as are washed ashore at different seasons of the year. It can also be observed that the Karwar coast is particularly rich in its molluscan fauna.

REFERENCES

1. Bather, F. A. (1900): *The Echinodermata*, Lankester's Treatise on Zoology (London).
2. Clark, A. H. (1932): 'On the collection of Crinoids from Indian Ocean and Bay of Bengal', *Rec. Ind. Mus.*, 34 (4): 551-566.
3. Eales, N. B. (1939): *The Littoral Fauna of Great Britain*, (Cambridge).

- 4. Gravelly, F. H. (1941): Shells and other animal remains found on the Madras beach. *Bull. Madras Govt. Mus.*, **5**, (1).
- 5. MacBride, E. W. (1922): *The Echinodermata, The Cambridge Natural History*, London.
- 6. Patil, A. M. (1951): 'Study of the marine fauna of the Karwar coast and Neighbouring Islands', Parts I & II, *J.B.N.H.S.*, **50**: 128-139, 549-558.
- 7. — — — (1952): 'Study of the marine fauna of the Karwar coast and Neighbouring Islands', Part III. *J.B.N.H.S.*, **51**: 29-41.
- 8. Smith, Malcolm, A. (1943): *Reptilia and Amphibia*, Vol. III. *The Fauna of British India, Ceylon and Burma* (London).
- 9. Various Authors, (1927): *The Littoral Fauna of Krusadai Island in the Gulf of Manaar (Madras)*.

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